

Background

- DT Swiss is a high-end bicycle rim manufacturer located in Grand Junction, CO (20000 rims/year)
- Decals of the company's logo are applied to the outside of the carbon fiber rims before adding the spokes
- The projects design was based upon the Application Process of the Decals:
 - 1) Add waterslide decal to raw rim
 - 2) Hang on bread rack (Inspection 1)
 - 3) Transfer rims from bread rack to the baking rack
 - 4) Move the baking rack into the oven
 - 5) Bake 1 (20min, @80°C)
 - 6) Inspection 2 (pink film removal)
 - 7) Bake 2 (30min, @150°C)
 - 8) Inspection 3
 - 9) Boxed for spoke addition
- Our solution is to improve this process by combining steps 2 & 3. Instead of hanging the rim in step two onto a bread rack it will go directly into a rack designed for the oven

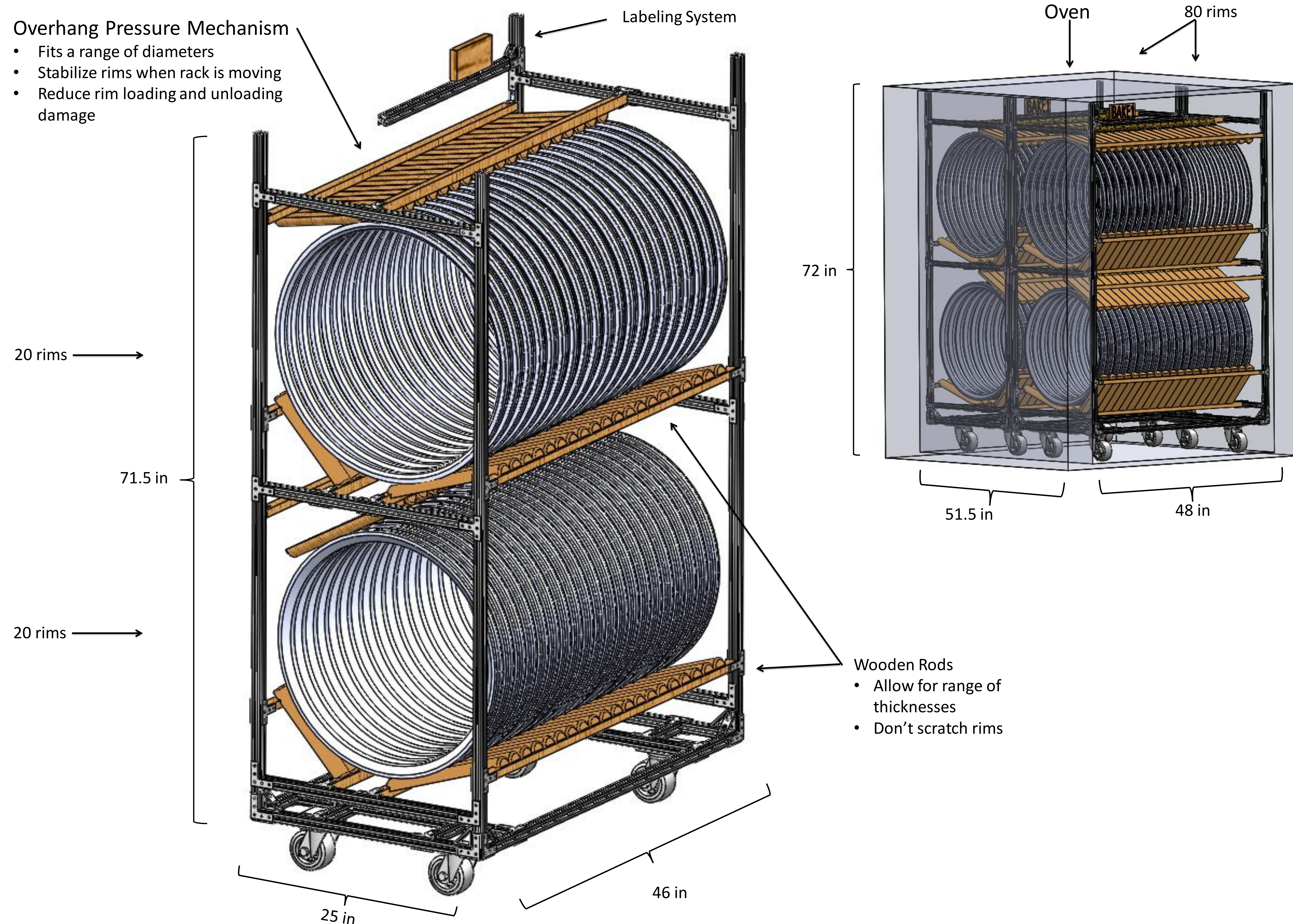
Design Requirements

- Fit in ovens inner dimensions (48"x51.5"x72")
- Fits 25% more rims than the current baking rack
- Include a labeling system to indicate rim diameters and thicknesses, and baking process number
- Decrease the damage of handling by 5%
- Hold variety of rims (Diameter of 27.5-29" and width of 18-45mm)

Design Evaluation

- This project will be evaluated considering 2 approaches:
- Physical testing of the rack's performance:
 - ie. Size, Rim stability.
 - Value added to the company:
 - ie. Overall decal process time, Process efficiency

Half Rack Design



Frame material: Extruded 80/20 1" Aluminum

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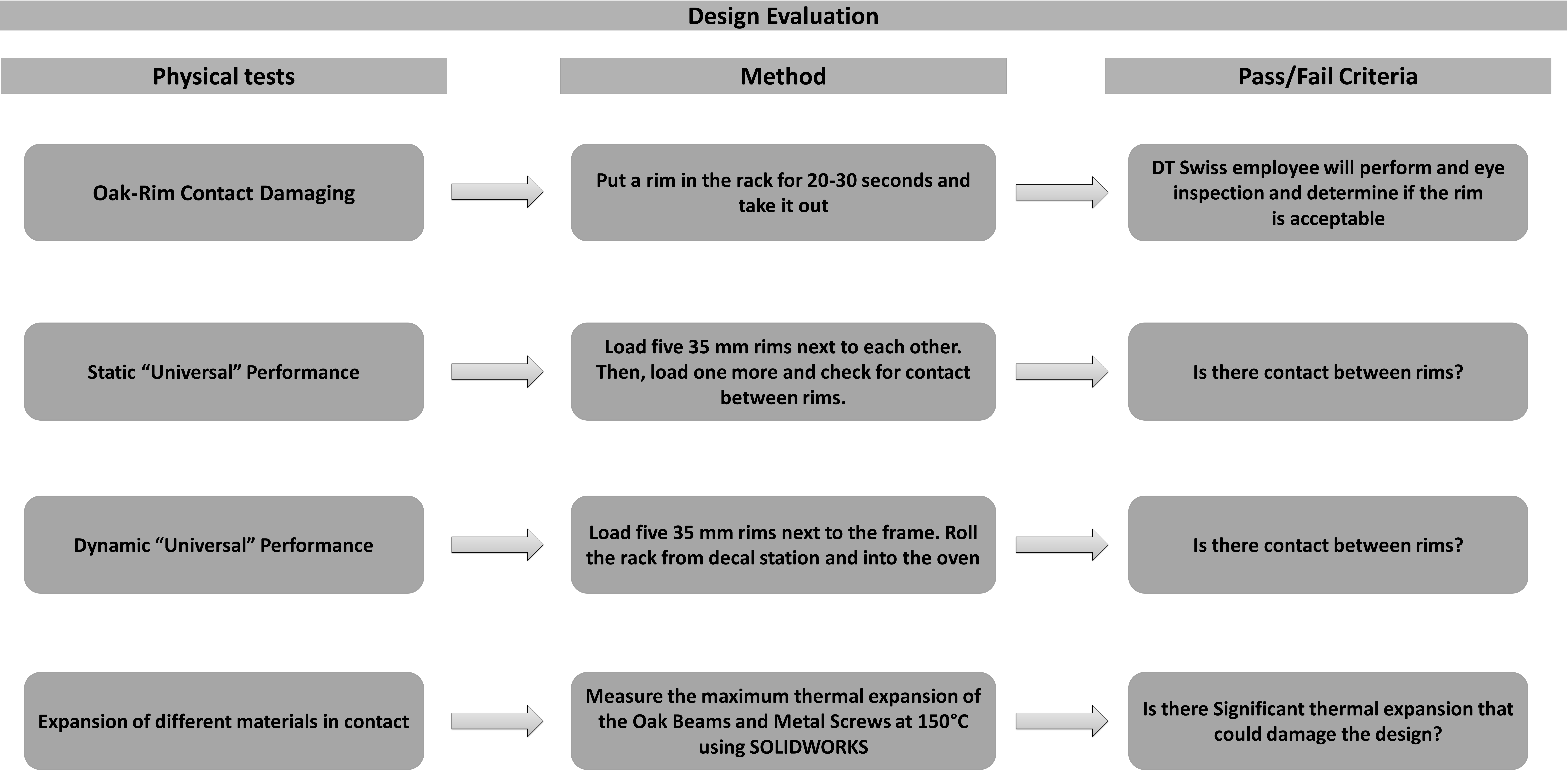
SCAN ME



To see the Designed Baking Rack Video, please scan the QR code to the left

Acknowledgements

We want to thank Professor McNeill for guiding us through this process and our sponsors Kory Moore and Aaron Breckenridge from DT Swiss for giving us the opportunity to develop this product for them.



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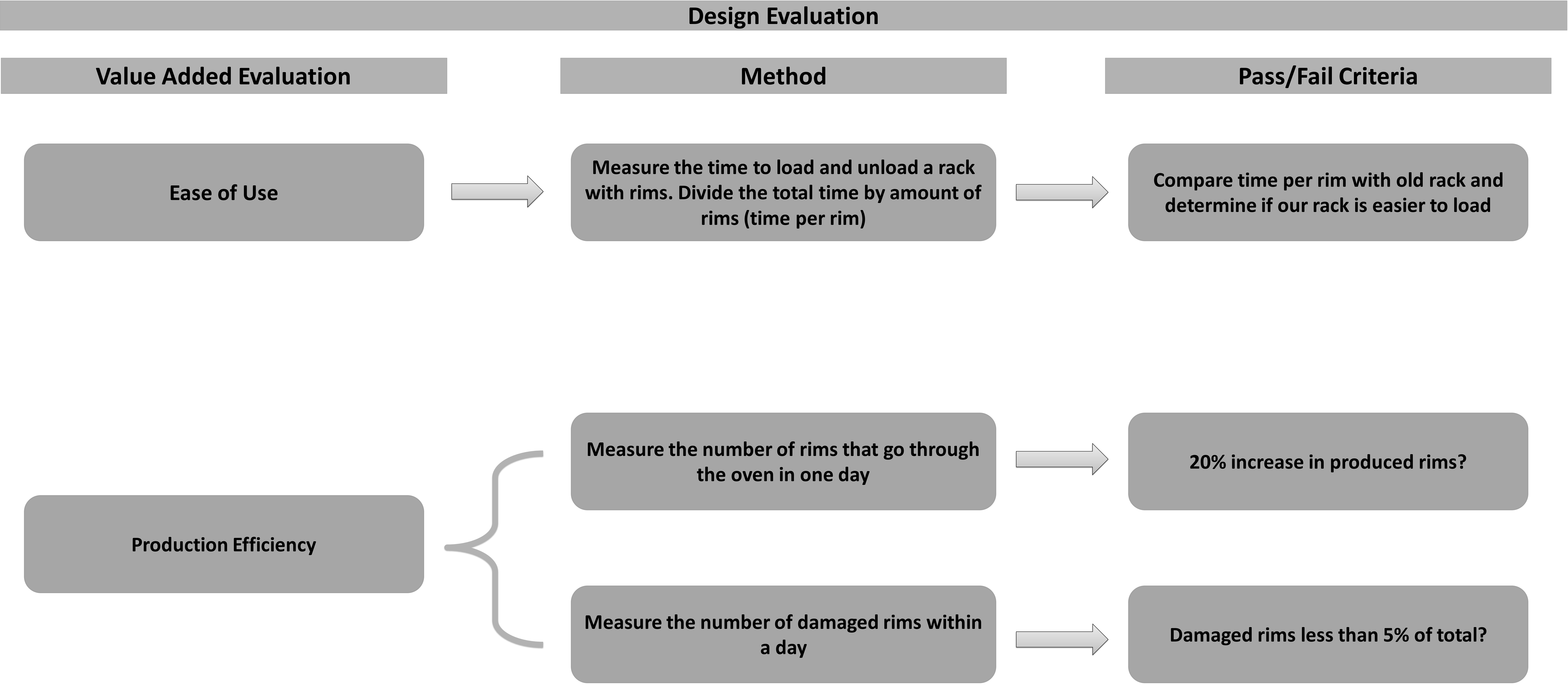
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Conclusion

- Considering limitations, the project was successful
- The team was able to design a rack that meets all the requirements from sponsor
 - Fits the oven inner dimensions (48"x51.5"x72")
 - Fits at least 74 rims
 - Includes a labeling system to indicate rim diameters and thicknesses, and baking process number
 - Holds variety of rims (Diameter of 27.5-29" and width of 18-45mm)
- Even though the rack is not fully manufactured at the moment, complete documentation will be handed off for a straightforward completion.
- Learning process
 - Improved working in team format for long periods of time
 - Improved long term project management
 - Improved machining skills and design for manufacturing concepts

Next Steps

- Complete Manufacturing of the rack
- Finalize testing and evaluations
- Manufacture second half of the rack
- Implement new racks in the DT Swiss Decals application process

Recommendations for future rack manufacturing

- Weld the frame together (Use Aluminum 1x1in square profile)
 - Reduce Assembly time and complexity.
 - Reduce maintenance
 - Increase stability and durability of the rack
- Utilize thicker wooden beams for holding wooden rods
 - Increase stability
 - Increase safety
 - Reduce maintenance frequency
- Consider redesigning the support wooden rods
 - Simplify attachments
- Casters positioning
 - Smaller Caster



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